

## Halogenated Solvent Cleaning 40 CFR 63.460 – Subpart T

MACT Training  
March 5, 2003

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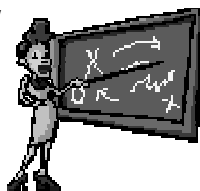
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### Overview

- Applicability
- NE Sources
- Compliance Deadlines
- Compliance Options
- Video
- Recordkeeping & Reporting
- Inspections
- Permitting
- EPA's Web Expert & SAGE



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### Applicability

- Each batch vapor, in-line vapor, in-line cold, and batch cold halogenated solvent cleaning machine
- Halogenated Solvents
  - Methylene chloride (75-09-2)
  - Perchloroethylene (127-18-4)
  - Trichloroethylene (79-01-6)
  - 1,1,1-trichloroethane (71-55-6)
  - Carbon tetrachloride (56-23-5)
  - Chloroform (67-66-3)

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## Exemptions

- Buckets, pails, and beakers with capacities of 2 gallons or less
- Concentration less than 5 percent by weight
- Wipe cleaning activities, such as using a rag or spray cleaner containing halogenated solvent

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## NE Sources

- Went from 10 to 3 sources
- Bruckman Rubber - Hastings
  - Area Source
  - Batch Vapor
  - Alternative Standard
- American Shizuki – Ogallala
  - Synthetic Minor
  - Batch Vapor
  - Alternative Standard



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## NE Sources

- Dutton Lainson - Hastings
  - Major Source
  - Batch Vapor
  - Control Combo – Freeboard Refrigeration Device, Freeboard Ratio of 1.0, and Reduced Room Draft

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## Compliance Deadlines

- New sources (constructed or reconstructed after 11/29/93)
  - Upon startup or 12/2/94
- Existing sources (except continuous web cleaning)
  - 12/2/97
- Continuous web cleaning
  - 12/2/99

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## Compliance Options

- Batch Cold Cleaning
- Batch Vapor and In-line Cleaning
  - Control Combinations
  - Idling Emission Limits
  - Alternative Standards

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## Batch Cold Cleaning

- Use heated, non-boiling solvent to clean parts
- Parts move through entire cleaning cycle before new parts added

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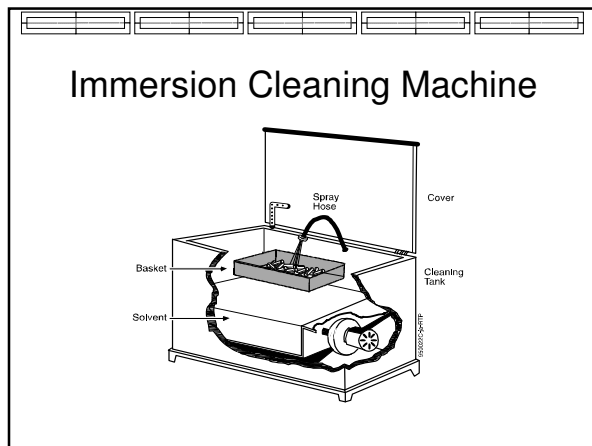
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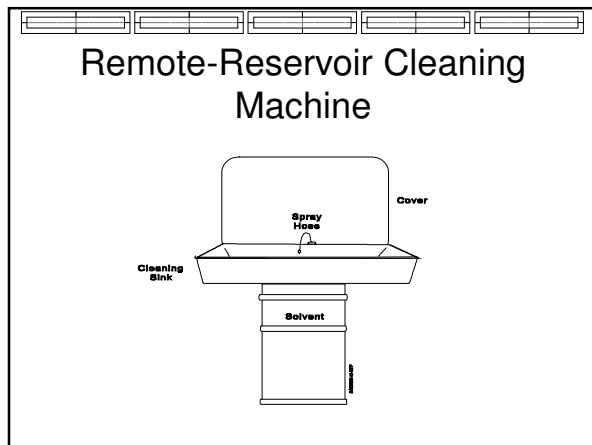
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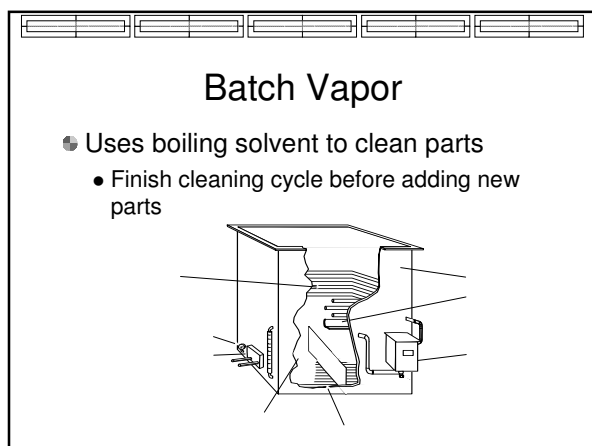
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### In-line

- Cold or Vapor
  - Automated parts handling system to provide continuous supply of parts to be cleaned




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### Batch Vapor & In-line Control Options

- Control Combinations
- Idling Emission Limits
- Alternative Standards




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### Required Elements for Each Compliance Method

	Equip. Design	Control Comb.	Operating Practices	Emission Limits
Control Comb.	X	X	X	N/A
Idling Emissions	X	N/A	X	X
Alternative Standards	N/A	N/A	N/A	X

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## Hoists

- Mandatory equipment design – not an option
  - Calculate hoist speed by measuring the time it takes for the hoist to travel a measured distance and report it in meters per minute. To convert from feet to meters, multiply the distance in feet by .305
  - Check hoist speed monthly unless
    - Does not exceed 11 ft/min for one year – then can monitor quarterly

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## Solvent/Air Interface

- Vapor machine
  - Location of contact between the concentrated solvent vapor layer and the air - the mid-line height of the primary condenser coils
- Cold cleaning
  - Location of contact between the liquid solvent and the air

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## Solvent/Air Interface

The diagram illustrates a solvent cleaning system. It shows a central chamber with a solvent/air interface at the top. Below this interface is a condensate trough. To the right of the chamber are condenser coils. A freeboard is indicated at the top of the chamber. The diagram is labeled with 'Solvent/Air Interface', 'Condensate Trough', 'Freeboard', and 'Condenser Coils'.

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## Solvent/Air Interface

• The solvent-air interface area of your machine(s) can be determined in any of the following ways:

- Check the literature that was provided with the machine at the time of purchase;
- Ask the manufacturer of the machine; or,
- Calculate the area by multiplying the width by the length of each sump and totaling the areas of all sumps.

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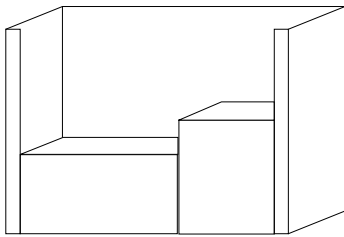
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## Solvent/Air Interface




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## Control Combinations

Small Batch Vapor (solvent/air interface area of 13 ft<sup>2</sup> or less)

Control Technology	1	2	3	4	5	6	7	8	9	10
Working-mode Cover	X		X							
Freeboard Ratio of 1.0	X			X		X		X		X
Freeboard Refrig. Device		X	X		X	X	X		X	
Superheated Vapor	X	X		X						X
Reduced Room Draft				X	X			X		
Dwell Time							X	X		
Carbon Adsorber									X	X

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### Control Combinations

Control Technology	1	2	3	4	5	6	7
Working-mode Cover			X				
Freeboard Ratio of 1.0	X			X		X	
Freeboard Refrig. Device	X	X	X		X	X	X
Superheated Vapor	X		X	X	X		X
Reduced Room Draft		X		X	X	X	
Dwell Time		X					
Carbon Adsorber							X

Large Batch Vapor (solvent/air interface area of >13 ft<sup>2</sup>)

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### Control Combinations

Control Technology	1	2	3	4
Freeboard Ratio of 1.0	X	X		
Freeboard Refrig. Device		X	X	
Superheated Vapor	X			
Dwell Time			X	X
Carbon Adsorber				X

Existing In-Line

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### Control Combinations

Control Technology	1	2	3
Freeboard Refrig. Device	X	X	
Superheated Vapor	X		X
Carbon Adsorber		X	X

New In-Line

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## Control Options

- Freeboard refrigeration device**
  - Set of condenser coils in the freeboard region that creates a chilled air blanket to condense the solvent vapor and prevents its escape
  - Must create a cool air zone 30% or less of the solvent's boiling point

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## Control Options

- Minimum temperatures for refrigeration devices for each solvent**
  - Methylene chloride: 31.2°F
  - 1,1,1 trichloroethane: 49.5°F
  - Trichloroethylene: 56.7°F
  - Perchloroethylene: 75.0°F
  - Carbon Tetrachloride: 50.0°F
  - Chloroform: 43.0°F
- Temperature must be recorded weekly**
  - Measure in center of air blanket while idling

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## Control Options

- Freeboard ratio of 1.0**
  - Freeboard height divided by the smaller interior dimension (length, width, or diameter) of degreaser
  - Batch cleaners freeboard height – distance from the solvent/air interface to the top of the idling degreaser
  - In-line freeboard height – distance from solvent/air interface to the bottom of entrance or exit, whichever is lower.

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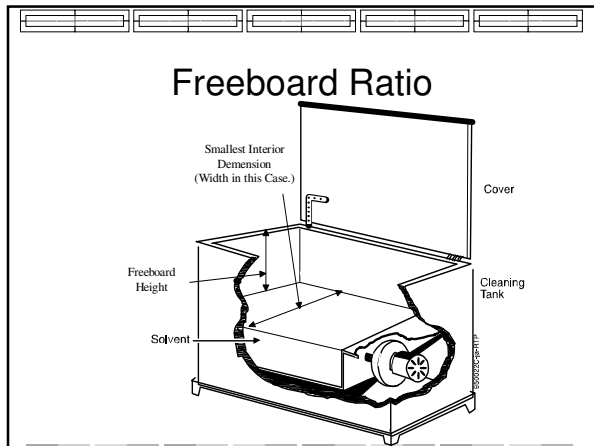
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## Control Options

- **Reduced Room Draft**
  - Must keep air flow across freeboard area or inside the machine to less than 50 ft/min
  - Controlling room parameters
    - Determine max wind speed with an air velocity meter on each of four corners of the degreaser. Measure the wind speed within 6 inches above freeboard
    - Record max reading for each corner
    - Average values
    - Lower the velocity if the average wind speed is greater than 50 ft/min (eg, redirect fans), and
    - Monitor weekly

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## Control Options

- **Reduced Room Draft**
  - Enclosures
    - Determine max wind speed inside enclosure with air velocity meter
    - Conduct monthly monitoring of air velocity and inspections for cracks, holes, or other defects




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## Alternative Standards – Batch or In-line Vapor

- With Solvent/Air Interface
- Three month rolling average
- Emission Limits
  - Batch Vapor – 30.67 lbs/square foot/month
  - Existing In-line – 31.28 “
  - New In-line – 20.24 “

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## Alternative Standards

- Equation 1
  - $E = \frac{SA-LSR-SSR}{S/A}$
  - Where E = weight/area
    - Solvent emissions for 1 month
- Equation 2
  - $E = E1 + E2 + E3/3$
  - 3 month rolling average for preceding 3 months



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## Recordkeeping & Reporting

- Spreadsheets from MACT manual
- Manual



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# Inspections

- Checklist
- Manual



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# Permitting


- All batch & in-line vapor must obtain Title V operating permit
- Area sources deferred from Title V permitting until 12/9/04
- Area source Cold Batch Cleaners
  - Not subject to Title V permitting

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## EPA Web Resources

- Web Expert
  - <http://icode.trintegral.net/rules/subpartt/>
- SAGE
  - Solvent Alternatives Guide
  - Pollution prevention guide to alternate solvents
  - <http://clean.rti.org/>



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